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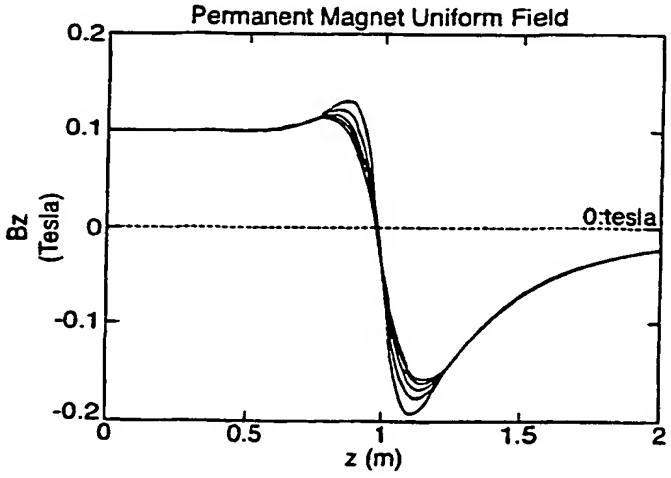
(54) Title: PERMANENT MAGNET AND SHIM DESIGN



(57) Abstract: A general method for the design of structures composed of permanent magnetic material for producing and modifying magnetic fields. The method employs a finite set of permissible spatial harmonic modes upon a surface. In particular, it has applications where the structures are finite and open, for which an exact solution is not possible. The method determines an optimum distribution based upon a least squares minimization of the difference between the achievable and desired field within a Region Of Interest (ROI). The method also has application in passively improving the homogeneity of existing magnetic fields (shimming) by distributing magnetic materials in the vicinity of the ROI.

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